**What lurks beneath the sea?**

**Discovering how the Northern Gulf of California opened**

**(Seismic Jigsaw lab)**

**Goal:**

By the end of the lab, students should be able to 1) recognize, name and explain key features in an uninterpreted seismic cross-section, 2) interpret and describe the events that occurred based on the seismic data, and 3) describe the spatial and temporal evolution of the northern Gulf of California.

**Part I**

The youngest layers were deposited in the last few million years. Older layers extend back into the Miocene and earlier. Examine the line and then, using colored pencils, draw on and label all the features you see in the line. Consider the questions below and then write up a short paragraph describing the main features and what they tell you about the history of your area, i.e., what events created your features. Use the questions below as guidance.

* What part of the seismic line has well-defined layers and what areas don’t?
  + What could the non-layered areas represent?
  + What is the geometry of the layers? Is there any variation in this geometry? Can you define sets of layers?
* Are there faults?
  + If yes, what is their spacing, size and timing
  + Are they active or inactive and how would you tell the difference? Are different faults active at different times?
  + Are there growth faults and growth strata?
* Do the answers to these questions vary across the cross-section?

By the end of Part I, each of you should have a marked and labeled cross-section and a short write-up. You will be responsible for describing your group’s conclusions to new co-workers in the next Part so make sure you understand and can explain this.

**Part II**

You will be assigned to a new team consisting of one person from each of the previous groups.

1. Each person will take a turn showing their cross-section and explaining the interpretations to the new group members.
2. As a group, discuss the similarities and differences between the cross-sections and the interpreted history of events. Have one person take notes and list these.
3. Ask your supervisor to review your list of observations on these similarities and differences.
4. Now your instructor will give you a location map of the cross-sections. Think about and discuss how the lines relate spatially to one another. Where are the major features found? Draw in major features on the location map. How do the features on different sections relate to one another?
5. Write a geologic history of the northern Gulf of California based on your data (one write-up per group). Be ready to explain your answers to the entire company.

**Part III Group Discussion and Wrap-up**

Each group will present and defend their results. One person from each group will be called at random to come up and give a short review of your group’s conclusions.